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REMARKS

In the Office Action dated June 22, 2004, claims 1-40 are pending. Applicant recognizes the allowability of claims 9, 20, and 36 if rewritten in independent form. Claims 1, 4, 6, 24, 26, and 37 are independent claims from which all other claims depend therefrom.

Claims 1-7, 11-19, 21-22, 24-35, 37-38, and 40 stand rejected under 35 U.S.C. 102(b) as being anticipated by Rudolph et al. (USPN 4,161,780).

Claims 1, 6, and 26 have similar limitations and are therefore described together. Claim 1 recites a reorientation controller for a satellite, claim 6 recites a satellite reorientation system, and claim 26 recites a method of reorienting the spin axis of a satellite. Claims 1, 6, and 26 all include the limitation of introducing a phase lead into a slew rate command signal.

A slew rate command signal has a magnitude and a phase, which are used to compensate for error in a magnitude and a phase of a satellite spin axis. Spin phase error refers to the angular error about the satellite spin axis. It is desired when performing a spin axis excursion to follow a minimum angle slew. Due to finite control bandwidth and control transport time delay the slew rate response lags in phase. In introducing a phase lead into a slew rate command signal the controller of claim 1 compensates for this phase lag.

Rudolph discloses a spin rate timing system. The timing system provides a method for firing satellite thrusters. A controller, a select shift register, a delay shift register, a delay counter, a firing-pulse counter, and a one-shot multivibrator are utilized in the timing of the thrusters. The controller receives signals from an earth sensor and a solar sensor including a select word and a delay word. The select word contains instruction for data collection and firing control. The delay word provides the delay time for the firing of the thrusters. The delay time is inputted into the delay counter from the delay shift register upon receiving a first pulse from one of the

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sensors. The delay counter begins a first count down. When the first count down in the delay counter reaches zero the one-shot multivibrator triggers the firing-pulse counter. The multivibrator triggers the thrusters during a second count down by the firing-pulse counter. Thus, the delay shift register of Rudolph simply stores a delay time for when the firing of the thrusters is to be initiated.

The Office Action states that Rudolph discloses a slew rate command generator that introduces a phase lead into a slew rate command signal, and in so doing refers to col. 2, lines 1-10 for delay shifting of SRT. Applicant, respectfully, traverses and submits that nowhere in Rudolph is spin phase mentioned nor is any adjustment thereof disclosed, taught, or suggested. For that matter, nowhere in Rudolph is phase error of any signal accounted for or adjusted. Rudolph discloses a delay time that is counted down before the firing of satellite thrusters; Rudolph does not disclose how one compensates for spin axis phase error. The determination of when to trigger satellite thrusters does not provide any insight as to how spin axis phase is adjusted, nor does it suggest the introduction of a phase lead.

In addition, not only is it clear that a delay time or an initial trigger time of satellite thrusters is unrelated to the introduction of a phase lead into a slew rate command signal, the terms "delay" or "lag" and the term "lead" are antonyms. Thus, not only are the tasks performed different the terms utilized to describe the tasks are opposites.

Thus, since Rudolph fails to teach or suggest the introduction of a phase lead into a slew rate command signal, Rudolph fails to teach or suggest each and every element of claims 1, 6, and 26, therefore claims 1, 6, and 26 are novel, nonobvious, and are in a condition for allowance. Also, since claims 2-3, 7, 11-19, and 21-22 depend from claims 1, 6, and 26 respectfully, claims 2-3, 7, 11-19, and 21-22 are also novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Claims 4, 24, and 37 recite similar limitations and are therefore described together. Claim 4 recites a reorientation controller, claim 24 recites a satellite

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reorientation system, and claim 37 recites a method of reorienting the spin axis of a satellite. Claim 4 recites the limitations of performing a spin phase synchronization when a target attitude is unsynchronized in spin phase with an initial attitude. Claims 24 and 37 recite the limitation of performing a spin phase synchronization.

The Office Action states that Rudolph discloses the above stated limitations of claims 4, 24, and 37 and refers to col. 1, lines 55-60 and again col. 2, lines 1-10. Applicant submits as stated above that nowhere in Rudolph is spin phase mentioned or suggested. In col. 1, lines 55-60 Rudolph states that the processor uses data from the spacecraft to determine a present orientation including roll, pitch, yaw, and spin rate and that a firing sequence is determined to reorient the spacecraft. Again spin phase is not mentioned. Also spin rate is not the same as spin phase. Spin rate is the speed at which a spacecraft is rotating about a spin axis. Spin phase refers to the angular position about a spin axis. In addition, in adjusting orientation of a spacecraft one is not necessarily adjusting spin phase. One may even adjust the orientation of a spacecraft spin axis and not adjust the spin phase thereof.

Thus, since there is no mention of spin phase anywhere in Rudolph there is clearly no mention of spin phase synchronization nor is there any suggestion of performing a spin phase synchronization when a target attitude is unsynchronized in spin phase with the initial attitude. Therefore claims 4, 24, and 37 are also novel, nonobvious, and are in a condition for allowance. Since claims 5, 25, 38, and 40 depend, respectfully, from claims 4, 24, and 37, claims 5, 25, 38, and 40 are also novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Claims 8, 10, 23, 30, 35, and 38 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rudolph et al. in view of Whitmore (USPN 6,061,611). Applicant assumes the Examiner meant to reject claim 39 not claim 38 under 35 U.S.C. 103(a) since claim 39 stands rejected and is not referred to in any of the arguments of the Office Action. Nevertheless, Applicant submits that since claims 6, 26, and 37 are novel, nonobvious, and in a condition for allowance and since claims 8, 10, 23, 30, 35, and 38-

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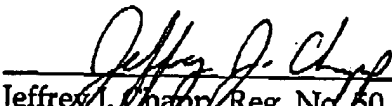
39 depend, respectfully, from claims 6, 26, and 37, claims 8, 10, 23, 30, 35, and 38-39 are also novel, nonobvious, and are in a condition for allowance for at least the same reasons.

In light of the remarks, Applicant submits that all rejections are now overcome. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, the Examiner is respectfully requested to call the undersigned attorney.

The Commissioner is hereby authorized to charge any fees related to this Office Action response or credit any overpayments to Deposit Account No. 50-0476.

Respectfully submitted,

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